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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/707,274

12/02/2003

KUO-CHIANG CHEN

20.2894

1273

23718

7590

10/17/2005

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EXAMINER

AURORA, REENA

ART UNIT

PAPER NUMBER

2862

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/707,274		CHEN ET AL.	
	Examiner		Art Unit	
	Reena Aurora		2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03/08/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/02/03, 06/07/04, 05/02/05</u> <i>RA</i> | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. (20050030038).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to claim 1, Chen et al. (hereinafter Chen) discloses a well logging tool including an elongated conductive mandrel (51, fig. 2) having a longitudinal axis; an antenna array (15, 16, 17) positioned about the mandrel (51) and including a transmitter (15) for transmitting electromagnetic energy into the formation; a sleeve (11, fig. 3) positioned about the antenna array (15, 16, 17), the sleeve (11) having an outer surface positioned for exposure to the borehole environment and an inner surface positioned

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radially inward of the outer surface; a first electrode (12) having an outer end and an inner end positioned radially inward of the outer end, the first electrode being supported on the sleeve (11) such that the outer end is exposed on the outer surface of the sleeve for conductive contact with an adjacent conductive borehole environment (10); and a second electrode (12, below transmitter) having an outer end and an inner end positioned radially inward of the outer end, the second electrode being supported on the sleeve (11) such that the outer end is exposed on the outer surface of the sleeve for conductive contact with the adjacent conductive borehole environment (10), the first (12, above transmitter) and second (12, below transmitter) electrodes being spaced longitudinally apart such that the transmitter (15) is positioned longitudinally therebetween; and wherein the first (12, above transmitter) and second (12, below transmitter) electrodes are conductively interconnected with the mandrel (51) such that when the well logging apparatus is operated in a borehole environment having borehole currents therein, one or more current path loops are provided for shorting borehole currents, the current path loops including a first conductive path between the conductive borehole environment, the first electrode, and the mandrel, and a second conductive path between the conductive borehole environment, the second electrode, and the mandrel (para 0043).

As to claims 2 and 3, Chen discloses that the electrode (12) is a component separate from, and movable relative to, the mandrel (51, fig. 2, 3).

As to claim 4, Chen discloses that the first set of electrodes (12, above transmitter) supported on the sleeve (11) above the transmitter (15) and azimuthally

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spaced apart about the sleeve, the first set including the first electrode, wherein each of the electrodes of the first set are conductively interconnected with the mandrel (51); a second set of electrodes (12, below transmitter) positioned below the transmitter (15) and azimuthally spaced apart about the sleeve (11), the second set including the second electrode, wherein each of the electrodes of the second set are conductively interconnected with the mandrel; a second set of electrodes positioned below the transmitter and azimuthally spaced apart about the sleeve, the second set including the second electrode, wherein each of the electrodes of the second set are conductively interconnected with the mandrel; and wherein each of the electrodes of the first and second sets has an outer end and inner end positioned radially inward of the outer end, each said electrode being supported on the sleeve such that the outer end of each said electrode is exposed on the outer surface of the sleeve for conductive contact with the adjacent conductive borehole environment, and such that the current path loops include current path loops between the conductive borehole environment, and electrode of the first set of electrodes, the mandrel, an electrode of the second set of electrodes, and the conductive borehole environment (Note para 0043).

As to claim 5, Chen discloses that the sleeve material having a plurality of channels (55, FIG. 3 and 4) each radially extending therethrough for supporting one of the electrodes (12).

As to claims 6 – 8, Chen discloses that the channel (55) is sized to provide a gap between the sleeve (11) and the electrode (12), the well-logging apparatus.

As to claim 9, Chen discloses that the electrode is positioned in the channel (55) such that outer end is spaced radially inwardly of the outer surface of the sleeve (11).

As to claims 10 – 15, Chen discloses that the outer end is provided by a metallic plate (52d) having slots provided thereon, the slots forming a conductive path across said plate.

As to claims 16, Chen discloses that the antenna array further includes a receiver (16) for receiving a response signal from the formation, the receiver being positioned about the mandrel (51).

As to claim 17, Chen discloses that a non-conductive sleeve positioned about the antennal array and about a longitudinal axis the well logging apparatus, the sleeve (11) having an outer surface positioned for exposure to the borehole environment and an inner surface positioned radially inward of the outer surface; a first set of electrodes (12) supported on the sleeve (11) longitudinally above the transmitter (15) and azimuthally spaced apart about the sleeve (11), the electrodes of the first set being conductively interconnected with the mandrel (51); and a second set of electrodes positioned longitudinally below the transmitter and azimuthally spaced apart about the sleeve (11), the electrodes of the second set being conductively interconnected with the mandrel; and wherein each of the electrodes of the first and second sets has an outer end and an inner end positioned radially inward of the outer end, the outer end of the electrode being exposed on the outer surface of the sleeve for conductive contact with an adjacent conductive borehole environment, such that when the well logging apparatus is operated in a borehole environment having borehole currents therein, current path loops

are provided for shorting borehole currents, the current path loops including current path loops between the conductive borehole environment, the first set of electrodes, the mandrel, the second set of electrodes, and the conductive borehole environment (para 0043).

As to claims 18 – 19, Chen discloses a first set of conductive connections (52a) and a second (52b) set of conductive connections, each said conductive connection being disposed between one of the said electrodes (12) and the mandrel (11) to conductively interconnect the electrode (12) with the mandrel (11), such that the current path loops include a radially conductive path between the conductive bore-hole environment, the electrode, the conductive connection, and the mandrel, and wherein the conductive connection is separated from and movable relative to the electrode (12) and the mandrel (11).

As to claims 20 – 22, Chen discloses that the channels (55) are sized to provide a gap between the sleeve (11) and the electrode (12), the sleeve assembly further comprising a flexible, non-conductive material (53) situated in the gap between the electrode (12) and the sleeve (11).

As to claims 23 – 25, Chen discloses that outer end is provided by a slotted metallic plate (52d, fig. 8) defining a narrow, continuous conductive path.

As to claims 26 – 30, Chen discloses a method of reducing borehole current effects including the steps of providing a well logging apparatus having an elongated conductive mandrel (51) with a longitudinal axis, an antenna array (15, 16, 17) positioned about the mandrel (51) and including a transmitter (15) for transmitting

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electromagnetic energy and a receiver (16, 17) for receiving a response signal from the formation, a sleeve (11) positioned about the antenna array (15, 16, 17), the sleeve (11) having an outer surface positioned for exposure to the borehole environment and an inner surface positioned radially inward of the outer surface; supporting an upper set of electrodes (12) in the sleeve at a position longitudinally above the transmitter (15) and a lower set of electrodes (12) in the sleeve (11) at a position longitudinally below the transmitter (15), whereby electrodes of the first (12) and second (12) sets radially extends between the outer surface of the sleeve and the inner surface, such that the upper set of electrodes and the lower set of electrodes are conductively interconnected through the mandrel; positioning the well logging apparatus in the borehole such that the outer surfaces of the electrodes are exposed to the conductive borehole environment; and operating the well logging apparatus to transmit electromagnetic energy into the formation, whereby borehole currents are generated in the conductive borehole environment; directing borehole currents into current path loops between electrodes of the first set of electrodes, the mandrel, electrodes of the second set of electrodes, and the conductive borehole environment thereby shorting the borehole currents and reducing the borehole current effect on the receiver (para 0043).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reena Aurora whose telephone number is 571-272-2263. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, E. Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Reena Aurora